



DEPARTMENT OF MECHANICAL ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY KANPUR
KANPUR, UTTAR PRADESH, INDIA, PIN - 208016
(An Institute of National Importance under Ministry of H.R.D., Govt. of India)

No. IITK/ME/SDE/2018/PLIF/OPTICAL_TABLE/4

Date: 31st July 2018

NOTICE INVITING TENDER

Subject: Supply & Installation of Optical Table along with Vibration Isolators

Indian Institute of Technology Kanpur invites quotations (*two bid system mode*) for the following to be supplied and delivered in Mechanical Engineering Department. Vendors are requested to send sealed quotations inscribing "*Quotation for Optical Table and Vibration Isolators*" along with compliance report, for the below listed products, as per given specifications.

| S No | Full Description of items/ store | Qty. | Delivery |
|------|--|----------------------|---------------------------|
| 1 | Supply & Installation of Optical Table 1 & 2 | 02 Nos. (1 No. each) | At the Earliest /Ex-Stock |
| 2 | Supply & Installation of Vibration Isolators | 04 Nos. | At the Earliest /Ex-Stock |
| 3 | Air Compressor | 01 No. | At the Earliest /Ex-Stock |

Tender Details:

| | |
|--|--|
| <u>Tender Reference No:</u> | IITK/ME/SDE/2018/PLIF/OPTICAL_TABLE/4 |
| <u>Item:</u> | Optical Table along with Vibration Isolators |
| <u>Tender Type:</u> | Open |
| <u>Date of Opening:</u> | July 31, 2018 |
| <u>Date of Closing:</u> | September 10, 2018 |
| <u>Pre-bid meeting:</u> | On or before August 14, 2018 |
| <u>Address for communication:</u> | DR. SANTANU DE Assistant Professor, Department of Mechanical Engineering Indian Institute of Technology Kanpur Pin – 208016, U.P., India Office: NL 302 (Northern Laboratory), IITK Telephone No. 0512-259-6478 (O) 0512-259-8709 (R) Fax No. +91-512-259-7408 E-mail: sde@iitk.ac.in |
| <u>Technical Contact Person</u> | MR. SAIKAT SARMA Office: NL 302, Department of Mechanical Engineering Ph. No. +91-8853144159 E-mail: sarmasaikat@gmail.com sarmasai@iitk.ac.in |



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Scope of Work:

This high precision vibration isolation table will be used for precise experiments like time resolved PLIF, Raman Spectroscopy, Holography, and Rayleigh Thermometry (all for combustion diagnostics). Total three or four high speed lasers, combustor/burners along with necessary optics (camera, intensifier, mirrors, mounts) will be mounted on the table. The vibration isolation table should be ready to handle all these experimental setups.

Section I: Technical Specifications for vibration isolation table:

The vendor should supply **very high quality pneumatic type** optical table with vibration isolator leg (separate legs) and all other necessary accessories on which **very precise experiment** like PLIF, holography can be done. Precise vibration isolation is needed to **handle high/ultra-high repetition rate pump and dye laser on the table.**

The desirable hardware capabilities and specifications are given below:

A. Honeycomb Breadboard/ Vibration Isolation Tabletop 1:

- 1) **Width:** 1500 mm
- 2) **Length:** 3000 mm
- 3) **Thickness:** ≥ 300 mm
- 4) **Construction:** Breadboard should have *symmetrical, isotropic construction* on all axis and all section of the table for thermal stability
- 5) **Mounting Holes:** M6
- 6) **Mounting Hole Pattern:** 25 mm grid
- 7) **Mounting Hole Borders/Distance from edge to first hole center:** 12.5 mm on all sides
- 8) **Mounting Hole Sealing:** Individual cups to provide sealed mounting holes (sealed holes)
- 9) **Surface Flatness:** ± 0.1 mm or less over 600 mm square or more
- 10) **Screw/Hole Depth:** ≥ 19 mm deep
- 11) **Corners:** should have large radius corners resulting in less pointed edges for lab safety
- 12) **Working Surface:** 400/430 series ferromagnetic stainless steel and machined matte finish
- 13) **Top Skin:** should be ≥ 4.6 mm thick
- 14) **Intermediate Core:** High density plated steel Honeycomb, at least 0.25 mm thick, proper stiffness and thermal stability
- 15) **Bottom Skin:** should be ≥ 4.6 mm thick
- 16) **Damping:** Optimized broadband damping/tune damping or better
- 17) **Maximum Dynamic Deflection Coefficient:** $\leq 0.4 \times 10^{-3}$
- 18) **Maximum Relative Table Top Motion:** < 0.2 nm
- 19) **Deflection Under Load:** $< 1.8 \times 10^{-3}$ mm for 150 kg or more load

B. Honeycomb Breadboard/ Vibration Isolation Tabletop 2:

- 1) **Width:** 1200 mm
- 2) **Length:** 3000 mm
- 3) **Thickness:** ≥ 300 mm
- 4) **Construction:** Breadboard should have *symmetrical, isotropic construction* on all axis and all section of the table for thermal stability
- 5) **Mounting Holes:** M6
- 6) **Mounting Hole Pattern:** 25 mm grid
- 7) **Mounting Hole Borders/Distance from edge to first hole center:** 12.5 mm on all sides



- 8) **Mounting Hole Sealing:** Individual cups to provide sealed mounting holes (sealed holes)
- 9) **Surface Flatness:** ± 0.1 mm or less over 600 mm square or more
- 10) **Screw/Hole Depth:** ≥ 19 mm deep
- 11) **Corners:** should have large radius corners resulting in less pointed edges for lab safety
- 12) **Working Surface:** 400/430 series ferromagnetic stainless steel and machined matte finish
- 13) **Top Skin:** should be ≥ 4.6 mm thick
- 14) **Intermediate Core:** High density plated steel Honeycomb, at least 0.25 mm thick, proper stiffness and thermal stability
- 15) **Bottom Skin:** should be ≥ 4.6 mm thick
- 16) **Damping:** Optimized broadband damping/tune damping or better
- 17) **Maximum Dynamic Deflection Coefficient:** $\leq 0.4 \times 10^{-3}$
- 18) **Maximum Relative Table Top Motion:** < 0.2 nm
- 19) **Deflection Under Load:** $< 1.8 \times 10^{-3}$ mm for 150 kg or more load

C. Pneumatic Type Individual Vibration Isolators/Table Top Supports :

- 1) **No. of Isolators:** Four (individual)
- 2) **Isolation Type:** Active / Pneumatic, automatic re-leveling vibration isolator with tuned damping
- 3) **Height Range :** 595 mm to 600 mm
- 4) **Leveling:** Automatic re-leveling (Should have suitable Self-Leveling Systems to allow for /compensate automatically for any changes in load distribution with High Repeatability & keep the table at constant height)
- 5) **Min Self Leveling Adjustment Range :** -13 mm, +5 mm (-0.51", +0.2") or better
- 6) **Self-Leveling Repeatability:** $\leq \pm 0.5$ mm (± 0.02 ")
- 7) **Maximum Load capacity (set of four):** ≥ 2500 kg.
- 8) **Vertical Resonant Frequency/Vertical Isolation Resonance:** 1.5 Hz or lower
- 9) **Horizontal Resonant Frequency/Horizontal Isolation Resonance:** 1.5 Hz or lower
- 10) **Vertical Transmissibility/Vertical Amplification at Resonance:** 12 dB or lower
- 11) **Horizontal Transmissibility/Horizontal Amplification at Resonance:** 12 dB or lower
- 12) **Vertical Transmissibility/Vertical Isolation at 5 Hz :** $\geq 90\%$
- 13) **Vertical Transmissibility/Vertical Isolation at 10Hz :** ≥ 97
- 14) **Horizontal Transmissibility/Horizontal Isolation at 5Hz:** $\geq 85\%$
- 15) **Horizontal Transmissibility/Horizontal Isolation at 10Hz:** $\geq 95\%$
- 16) **Max Air Supply :** 80 - 90 psi (550 - 620 kPa) or better Compressed Air
- 17) **Damping Capability:** The isolator must have suitable pneumatic dual-chamber air spring to damp vertical vibrations & with trifilar suspension system to damp horizontal vibrations
- 18) **Structural Stability and Compatibility:** Suitable large diameter cylindrical steel support for maximum stability & safety & to prevent least possible relative tabletop /breadboard motion. The isolators should be suitable and compatible with the table top to be quoted and all values should be compatible with the table top.

D. Portable Silent Air Compressor:

- 1) **Type:** Pneumatic air compressor
- 2) **Tank capacity :** 3.5 liters or more
- 3) **Maximum Air Pressure:** 800 kPa (116 psi)
- 4) **Air Pressure Delivery:** ≥ 12 litres/min at 40 – 90 psi
- 5) **Noise Level:** 35 dB or lower (given preference) at 1ft
- 6) **Air Filter :** should have high efficiency
- 7) **Electric Power :** Should be operated at 230VAC/50Hz,200W (Indian Standard)



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- 8) **Size & Weight** : Should be portable, very compact and light weight (≤ 20 kg)
- 9) **Design Safety**: There should be no oil carryover to air supply through its pump using suitable design
- 10) **Oil Refill**: At least *two* compressor Oil Refill Can for this Oil lubricated pump unit
- 11) **Compatibility with Isolator**: It should accept standard dimension (please indicate) outer diameter tubing which is compatible with the vibration isolators
- 12) **Other Necessary Parts**: It should be self-contained with suitable high grade air regulator, filter, receiver tank with pressure gauge, safety valve, drain, line pressure gauge, fittings and all necessary hardware/components (nothing more to purchase).

** Please indicate if there is any additional features related to any particular vendor.*

*** Please submit necessary test results/supporting documents along with the quotation. Also, please indicate the test conditions like test load, test vibration etc.*

Section II: Optional Items and Accessories:

A. Honeycomb Breadboard/ Vibration Isolation Tabletop:

The vendor may quote optical table top of the following dimensions optionally (all other specs are same as above):

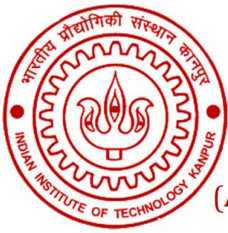
1. Length: ≥ 3600 mm
Width: ≥ 1200 mm
Thickness: ≥ 200 mm
2. Length: 2400 mm or more
Width: 1200 mm or more
Thickness: 200 mm

B. Honeycomb Breadboard (Cost Effective & Light Weight):

1. Length: ≥ 2400 mm
Width: ≥ 1200 mm
Thickness: 100 - 110 mm
2. Length: ≥ 1800 mm
Width: ≥ 1200 mm
Thickness: 50 - 60 mm

C. Free-Standing Optical Tables Shelves:

- Should be Stable, Free-Standing Design which Does Not Interfere with Vibration Isolation of the Optical Table with Frame height = 2 m or more
- Should have High-Load-Capacity (at least 125 kg per shelf) Shelving Spans Table Length
- Shelf Height should be Adjustable at least from 1 m to 2 m
- There should be provision of Through Holes in Frame to Allow for Easy Cable Management
- The underside of the shelves should have suitable provision to mount any suitable Power Distribution Strips/spike busters
- Should have provision to provide two shelf levels of storage space for instruments, power supplies, and other accessories.
- Each shelf should be at least 500 mm wide & 2.05 m long



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- Each shelf should be made of suitable medium density fiberboard with Min 125kg load capacity
- The vertical steel support struts should have suitable mounting points to allow height adjustment
- The Frame should have provision in future such that the Fiberboard shelves can be replaced with solid aluminum breadboards when using the suitable mounting brackets.
- Should have some provision like Lean bars to protect the Work Area from Accidental Knocks

* All the items listed in Module O are fully optional.
** The vendor may/may not quote these items according to their convenience.
*** The vendor has the freedom to quote other optional items and accessories also.
**** No marks will be given to these optional items and therefore merit will be judged according to the mandatory items (Section I) only.
**** **The institute may/may not buy optional item(s) according to available budget.**

Terms and Conditions:

1. Preparation of bids:

- Please submit your quote in **two parts**, i.e. **Technical Bid** and **Financial Bid**.
- The technical bid should **consist of all technical details** along with commercial terms and conditions
- Please indicate **item-wise price** in the Financial Bid for **each and every component**. The **unit prices** of each component and/or item should be mentioned. The vendor is also requested to **split the prices of each component** (as much as possible).
- If the vendor wants to offer some extra feature as optional then please indicate the price of those optional items separately
- The prices (in quotation) should be in **Indian currency**. For currencies other than Indian currency, please obtain a prior permission from the Institute.
- In case any of the items listed above require **Export License Compliance/End user certificate**, please **mention** in detail on the quote and also mention the necessary time for obtaining the export clearance.
- Bidder should organize the quotation in such a way that it should match the original technical specification mentioned above (**i.e., please indicate each component/feature mentioned above as it has been organized in the technical specifications section**). If there is **any extra feature/technical component/specs specific to the vendor please list/mention** that also on the technical bid. **Higher/better feature will be welcomed.**
- Bidders should **provide contact details (including contact no.) of technical service person/s** with the quotation document for communication during the tender process and in future to discuss technical and financial issues
- **Soft copy of Bid:** The vendor has to **send the soft copy of the technical bid to all email addresses mentioned above (sde@iitk.ac.in, sarmasaikat@gmail.com)** by **20th August, 2018**. If selected for the financial bid then the vendor also has to send the **soft copy of financial bid to all email address mentioned above**
- **Declaration to terms and conditions:** The vendor has to submit a written



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declaration (including necessary signature and stamp) along with the technical bid that they are accepting **all the terms and conditions written on this tender document without any deviation.**

2. Dates and time period:

- The date of opening the tender is **31st July, 2018**
- The last date for sending the quotation in **sealed envelope** is **10th September, 2018**
- The validity of quotation should be **at least 120 days**
- Vendors are requested to come for the pre –bid meeting **by 14th August, 2018**
- Delivery period should not be more than **8 weeks** from the date of purchase order and letter of credit (LC) and delivery should be at the Institute. However, **early delivery will be given preference.** The installation should be done **promptly whenever the institute notifies the vendor (within 14 days of notification period).**

3. Meetings and Presentation:

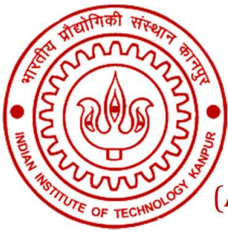
- The vendor **must** have to come to the institute for a **pre-bid meeting** session and according to purchase committee's decision this meeting has to be done **after floating the tender but before the bid is submitted by the vendor.** The date and time will be decided according to convenience. But, ideally the meeting should be within **14 days after floating the tender** and **based on the discussion the vendor should quote** accordingly
- The institute purchase committee may ask the vendor for a **technical presentation before financial bid**

4. Warranty:

- The vendor should provide a minimum **two years standard warranty** for the total dye laser system **from the date of installation** of the system. The warranty should include each and every components of the vibration isolation table. The warranty includes replacements of the damaged parts and onsite visiting charge, service charge, etc.
- The vendor should **quote additional one years** (after first 2 years) **warranty separately (as an option)** for the vibration isolation table. The institute may/may not **purchase** the extended warranty depending on available budget. This extended warranty also includes damaged parts replacements, visiting and service charge.
- The warranty should include onsite **visit and service** by the technical service team of the vendor for **at least twice a year within the warranty period.**
- The purchaser shall promptly notify the supplier/vendor if any problem arises in any of the dye laser and the supplier has to **reply and send their technical support team promptly and fix the problem/repair the item within 7 days or replace the faulty item/component within 30 days.**
- The vendor has to ensure **satisfactory after sales support and supply of spare parts for the system**
- Defective part in equipment, if found **before installation and/or during warranty period, shall be replaced within 30 days** (from reporting date by the institute). **Early replacement/delivery will be preferred.**

5. Supplier's Capability:

- The firm should represent **globally renowned OEM brand in this field with substantial**



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numbers of successful installations in India. Internationally *renowned brands will be given most preference.*

- The vendors are requested to **submit national and international customers list** who have used vibration isolation tables **for precise experiments** like PLIF, holography, Raman Spectroscopy etc. Based on the feedback of those customers the final decision will be made.
- Availability of after sales service and support in India. Supplier should **compulsorily** indicate details of facilities / expertise/ qualification of support staff in India. Factory trained engineer/s should be available in India for complete product support.
- The firm should supply **authorization certificate by the original equipment manufacturer**, for dealership/distributorship along with the quotation, if applicable. Parent company should be an established and reputed company with good number of installations
- The firm should give a declaration that they have not been blacklisted/debarred for dealing by Government of India in the past.
- The vendor should present should ensure that the **installation and training** should be provided by the **OEM's engineering team only**

6. Technical Details:

- The vendor **must fulfill** the above mentioned specification in the **technical specifications section**. These specifications are minimum criteria for participating in the tender process.
- The vendor should **mention all the technical specifications of each system component of the vibration isolation table in detail** and that should **at least match the above mentioned technical specifications**.
- The vendor has to submit **all technical brochures/catalogue, all data sheets, test results** with all technical details of the parts/components quoted. **All necessary drawing should be supplied** along with the quotation including all dimensions like **leg location, mounting dimensions** etc.
- The firm should **clearly mention under what condition the results related to the technical qualifications has been obtained** and the vendor may **submit supporting documents/results obtained by customer/journal papers as proof to their claim on technical specifications**. The Institute might ask for clarification to any technical quires or terms and conditions quoted by the vendor.
- Please note that the technical **specifications of the above mentioned system components** are only **indicative and minimum requirement**. If there are **specific system components (related to particular vendor)** required for total system integration and successful performance of the facility, then those **should be mentioned and provided. It is the responsibility of the bidder to include all the required accessories and components** for successful integration and operation of the facility.
- **Special features specific to any particular vendor** will be welcomed if they indicate that clearly on the quote
- Please **clearly mention** (in the quotation) **the OEM's name and model number** for each system component of the total facility. This is a **mandatory criteria**.
- The vendor should also supply all necessary **operation and maintenance manuals (written in English), drawings, (supplied by the OEM)** of each system component
- Non-compliance of tender terms, lack of clarity of all specifications, non-submission of required document or any contradiction may lead to rejection of the bid.



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- **Inspection and end test** prior to shipment of each and every items are *desirable* for the verification of the system performance. **End test certificate** provided by the OEM should be submitted to the institute at the time of delivery
- Under special condition and circumstances, the Institute can give *relaxation to any of the technical specifications*. Final marks will be given according to the final configuration selected

7. Payment terms and offers:

- The vendor is requested to quote in all possible payment ways:
 - a. Ex-works (Country of origin of the OEM)
 - b. FOB (nearest international airport of the OEM factory)
 - c. FOB (nearest international seaport of the OEM factory)
 - d. CIF (New Delhi Airport)
 - e. CIF (Kolkata/Mumbai Sea Port)

All these options should be quoted and accordingly final merit will be judged. The Institute will choose the right/cost effective/time effective options according to availability of funds and time available for total system set up.

- Normal payment terms for the institute will be applicable (*90% on delivery of the items and remaining 10% after satisfactory installation/inspection at the institute site*).
- The **total cost** (proposed in financial bid by the vendor) should **include delivery of all components and installation** of the total system along with successful operation of the facility.
- Suppliers shall be **entirely responsible** for **all taxes, duties, license fees, bank charges, packing and forwarding charges**, roads permits, etc., **incurred until delivery of the contracted system components to the institute**.
- For Imports, LC will be opened for (90% + 10%) FOB/CIF value after final purchase order.
- The vendor should provide maximum educational and other discounts and the price of the items should be quoted after applying all discounts.
- Institute is partially exempted from custom duty

8. Institute's rights:

- The institute reserves the right to **add or delete any item** from the item list. This means that the institute has the **right to choose** the **final item/component's** list to be purchased during the tendering process.
- The Institute reserves the right to **augment or provide relaxation** to any component/specifications, terms and conditions during the entire tendering process.
- The intender reserves the **right to withhold placement of final order**.
- The **right to reject** all or any of the quotations (at any time of the procurement process) and **to split up the requirements** or relax any or all of the above conditions without assigning any reason is reserved.
- The institute reserves the **rights to charge penalty or take any legal action** on **delayed delivery** of components, supplying **defected/used/refurbished/substandard equipment**.

9. Selection of Bid:

- The final selection will be made based on **weights given to technical merit (including**



fulfillment of technical specifications, terms and conditions) and pricing as 75% and 25%, respectively

- Technical merit will be judged according to the fulfillment of the technical specification (which the vendor must clearly mention)
- The pricing merit will be judged based on the best quotation price of the final items to be purchased.
- Please note that the final items/components list will be decided by the institute (as the ***institute reserves the right to add or delete any component during the total procurement/tendering process***) and the ***pricing merit will be based on this final components' list.***
- According to the final configuration/items list of the vibration isolation table facility (to be decided by the institute), ***LC will be selected.***

10. Packing and delivery:

- All the parts of the vibration isolation table are very delicate. The packaging should be such that ***none of the components get damaged*** during transit. The supplier has to ensure this and they should take care of all these issues during the shipment process. ***Damaged/partly damaged product will not be accepted.***
- ***In case of any defect/damage to equipment*** during the carriage of supplies from the origin of equipment to the installation site, the supplier has to ***replace it with a new one immediately*** at his own risk and responsibility. The supplier may deal this with their respective insurance company as per their convenience. ***IIT Kanpur will not be liable/responsible to any type of losses in any form.***
- Each Package should be marked (in three sides) with ***item nomenclature, OEM and model no., order/contract no., country of origin of goods, supplier's name and address, packing list reference no.*** and the marking should be done by ***proper paint/ink.***
- Documents to be supplied with delivery are ***4 copies of supplier/OEM invoice*** showing contact no., item description, quantity, unit price, total amount, all necessary end test certificates and ***2 copies of the packing list identifying the contents of each packing.***

11. Installation, Commissioning and Training:

- The Institute will provide the necessary lab space for the optical table. ***It is solely the supplier's duty to bring all the components of the vibration isolation table to the lab space. If there is any need of such material handling vendor that should be provided by the vendor only. No material handling cost will be provided for this purpose***
- ***Unloading and installation shall be the complete responsibility of the supplier.*** They should assemble the system and make the system operational. The supplier should also be responsible for suitable demonstration and smooth working of the entire system.
- We will use the ***M6 holes to mount optic, rails etc.*** The vendor has to ensure ***necessary support*** in doing that. Whenever the Institute call the vendor to help us out in mounting different component on the optical table the vendor should come promptly.
- Installation and commissioning should be done by the vendor promptly whenever the Institute inform them
- ***The supplier should provide the end test certificates from OEM carried out at the factory.***



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- **Training for each component, refilling, adjustment** of the vibration isolation facility should also be provided by the vendor
- **Shifting:** This is one of the necessary conditions. If there is any requirement of shifting the table to any other lab space then the vendor should provide it free of cost within the warranty period
- If the purchaser face some difficulties in realigning and reintegrating the total system for a specific set of experiment/acquiring result then the vendor must come to the institute promptly (after informing) and should sort out the issue. **Therefore true aftersales support is required.**

In case of any queries, you may please write to sarmasaikat@gmail.com and sarmasai@iitk.ac.in.

Kindly send the quotation in *sealed envelope* latest by **10th September, 2018** to the following address:

Dr. Santanu De
Assistant professor
NL 302 (Northern Laboratory)
Department of Mechanical Engineering
Indian Institute of Technology Kanpur
Kanpur-208016
Uttar Pradesh, India